TEST

# Trypsin and chymotrypsin in stool

This stool test measures protein-digesting enzymes released by the pancreas.

**WHAT IT MEASURES**
Pancreatic protein-digesting enzyme activity remaining in stool

**SAMPLE**
Stool

**FASTING NEEDED?**
No

**HOW LONG IT TAKES**
A few minutes for home collection

**RESULTS IN**
Usually a few days; timing varies by laboratory

**USED FOR**
Supporting diagnosis of pancreatic exocrine insufficiency

**MAIN LIMITATION**
Can miss mild pancreatic enzyme deficiency

## Overview

Trypsin and chymotrypsin are enzymes that help digest protein. They are made by the pancreas, an organ behind the stomach, and released into the small intestine. Some enzyme activity remains as food moves through the bowel and can be measured in stool.

Low activity may suggest that the pancreas is not releasing enough digestive enzymes. This is called exocrine pancreatic insufficiency , or EPI. However, a low result does not identify the cause and cannot confirm EPI by itself.

This is an older, indirect test of pancreatic function. Many laboratories now use fecal elastase , another pancreatic enzyme measured in stool, because it is generally more reliable and easier to interpret. Availability of trypsin and chymotrypsin testing differs between laboratories.

## Why the test is ordered

The test may be ordered when there is concern that food is not being digested properly because too few pancreatic enzymes are reaching the intestine.

Possible reasons include:

The test was historically used more often when investigating cystic fibrosis in infants and children. It does not diagnose cystic fibrosis. Newborn screening, a sweat chloride test and sometimes genetic testing are more appropriate for that purpose.

- Ongoing greasy, bulky or difficult-to-flush stools
- Unexplained weight loss or poor weight gain
- Signs of poor absorption of vitamins or other nutrients
- A history of chronic pancreatitis, cystic fibrosis or pancreatic surgery
- A need to assess pancreatic enzyme production when other tests are unavailable

## Who should have the test

A healthcare professional may consider this test if your symptoms and medical history suggest reduced pancreatic enzyme production. It may also be used when fecal elastase testing is not available.

The test is not usually useful as a general health screen. Changes in stool have many possible causes, and most are not due to pancreatic disease.

Tell the ordering team if you take pancreatic enzyme replacement, such as pancrelipase. These medicines contain digestive enzymes and may affect a stool chymotrypsin result. Do not stop prescribed enzymes unless you receive specific instructions.

## How to prepare

Fasting is not usually needed. You can normally eat and drink as usual, including drinking water or coffee.

Follow the collection instructions supplied with your kit. Some laboratories require one random sample, while others may request more than one because enzyme activity can differ between bowel movements.

Before collecting the sample:

Do not change your diet or stop medicines unless the ordering team or laboratory tells you to do so.

- Ask whether pancreatic enzyme medicine should be continued

- Label the container as instructed
- Keep urine, toilet water and cleaning products out of the sample
- Check how quickly the sample must be returned or refrigerated

## What happens during the test

You will usually collect the sample at home. Pass stool into a clean, dry collection device rather than directly into toilet water. Use the scoop supplied with the kit to place the requested amount into the specimen container.

Close the container firmly and wash your hands. Record the collection time if instructed. Return the sample according to the laboratory's directions, as delays or incorrect storage may affect enzyme activity.

No instrument is placed into your body, and a blood sample is not usually needed.

## Understanding your results

Results may be reported as a measured enzyme activity or as a category such as low, reduced or within the laboratory's expected range. Trypsin and chymotrypsin methods are not standardized across all laboratories, so there is no single reference range that applies everywhere.

Ranges and interpretation vary by laboratory, test method, age, sex, pregnancy status, medicines and clinical context.

A result within the expected range means pancreatic enzymes were detected in the stool. This makes severe pancreatic enzyme deficiency less likely, but it does not completely rule out mild or moderate EPI.

A low or absent result may mean that too little pancreatic enzyme is reaching the intestine. It may also reflect watery stool, altered movement through the bowel, enzyme breakdown during handling or another non-pancreatic factor. The result does not show why enzyme production may be reduced.

A high result does not usually mean that the pancreas is "overactive." Pancreatic enzyme replacement can increase measured chymotrypsin activity.

Results should be considered with your symptoms, weight changes, nutrition, medical history and other test findings.

## What affects the results

Several factors can make the result misleading even when the laboratory performs the measurement correctly.

Pancreatic enzyme replacement can raise stool chymotrypsin activity. This may produce a reassuring result even when your pancreas is not making enough enzymes. Whether medicine should be paused depends on the assay and your clinical needs.

Watery diarrhoea can dilute pancreatic enzymes and produce a falsely low result. A repeat test on a formed or semi-formed stool sample may be more useful.

Rapid intestinal transit gives enzymes less time to behave as expected during digestion. Very slow transit and changes in intestinal bacteria may also alter enzyme breakdown.

Collection and storage matter because these are active proteins. Contamination with toilet water or cleaning products, a delayed return, or storage outside the laboratory's instructions may change the result.

Age and digestive development can affect interpretation, particularly in newborns and young infants. The laboratory should use a method and interpretation suitable for the person tested.

Normal exercise, the time of day, kidney function and a recent blood transfusion do not usually have a meaningful direct effect on this stool test. Pregnancy is not generally a major influence, although every result still needs to be interpreted in its clinical context.

## Accuracy and limitations

Stool trypsin and chymotrypsin tests can identify some people with marked pancreatic enzyme deficiency. They are less dependable for mild or moderate deficiency, so the test can be normal even when pancreatic function is reduced.

The test can also report low activity when the pancreas is working adequately. Watery stool, rapid bowel transit and sample handling problems are important reasons for this type of misleading result.

Fecal elastase is generally preferred as the first stool test for suspected EPI. It is more stable in stool and, with commonly used laboratory methods, is not raised by pancreatic enzyme replacement. However, fecal elastase can also be falsely low in watery stool and can miss milder disease.

Other tests may be more useful in particular situations. These include tests for fat in stool, blood tests for nutritional deficiencies, pancreatic imaging and specialized direct pancreatic

function tests. Imaging can show structural problems but does not always show how well the pancreas is producing enzymes.

## Risks and complications

Collecting a stool sample has no significant physical risk. The main concerns are temporary unpleasantness and accidental contact with stool, which can be managed by careful handling and thorough handwashing.

## What happens next

An expected result may need no further testing if your symptoms have improved and there is little concern about pancreatic disease. Persistent symptoms may still require another test because a normal result does not fully exclude mild EPI.

A low result is often checked against the sample consistency, collection method and use of enzyme medicine. The next step may be a repeat sample or a fecal elastase test. Depending on your history, additional testing may look for poor nutrient absorption or changes in the pancreas.

Arrange routine follow-up for continuing greasy stools, unexplained weight loss, poor growth or recurring digestive symptoms.

Seek prompt medical advice for new yellowing of the skin or eyes, especially with fever, dark urine or abdominal pain. Severe or rapidly worsening abdominal pain, repeated vomiting, fainting, confusion or trouble breathing requires emergency assessment rather than waiting for a stool test result.

## Common questions

Can I drink coffee before the test?

Yes. Fasting is not normally required, so coffee should not affect the result unless your collection instructions say otherwise.

Does the time of day matter?

Usually not. Collect the sample from a bowel movement that allows you to follow the return and storage instructions.

Can I exercise beforehand?

Yes. Recent exercise is not known to meaningfully change stool trypsin or chymotrypsin activity.

Should I stop my pancreatic enzymes?

Not without specific instructions. These medicines can affect chymotrypsin results, but stopping them may worsen digestion. Ask the ordering team or laboratory what is required for the particular assay.

Can I collect the sample if I have diarrhoea?

Ask the laboratory. Watery stool can dilute the enzymes and cause a falsely low result. A formed or semi-formed sample may be preferred.

Can this test diagnose cystic fibrosis?

No. Low stool enzymes can occur with pancreatic insufficiency caused by cystic fibrosis, but diagnosis requires appropriate screening, sweat chloride testing and sometimes genetic testing.

## Sources

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